

REMARKS

In an office action mailed June 26, 2002, claims 1-8 and 10-14 have been rejected. By this amendment, claims 1-8 and 10-14 have been cancelled and new claims 15-31 have been added. Hence, claims 15-31 are pending in the application.

In the office action, the Examiner has brought to Applicants attention that an Abstract of the invention has not been submitted on a separate sheet in accordance with 37 C.F.R. 1.52(b)(4). In response, Applicants submit herein an Abstract on a separate sheet in accordance with 37 C.F.R. 1.52(b)(4). Applicants thank Examiner White for bringing this to their attention.

In the office action, claims 3, 6 and 8 have been rejected under 35 U.S.C. §112, second paragraph; claim 7, and 10-14 have been rejected under 35 U.S.C. §102(b); and claims 1-8 have been rejected under 35 U.S.C. §103(a). In response to the above objection and rejections, Applicants submit the following:

The Invention

The invention relates to the oxidation of starch. Applicants have surprisingly discovered a process for oxidizing a starch that requires significantly less oxidizing agent than processes of the prior art. The process and resulting starch products of the present

invention contain considerably less chlorine, which is desirable with respect to, for example, the environment.

The starch required by the present invention is a root or tuber starch comprising at least 95 wt.% of amylopectin (herein referred to as "amylopectin potato starch" or "APS"). APS is not a naturally occurring starch. Conventional root or tuber starches contain about 20% amylose and 80% amylopectin. By genetically modifying a root or tuber starch to eliminate or inhibit the expression of granule bound starch synthase (GBSS), it is possible to cultivate a root or tuber starch having little or no amylose, and, mostly or all amylopectin. See pages 5-7 of the specification.

As a result of the present invention, Applicants have discovered that APS can be oxidized by the process of the invention with much less oxidizing agent.

Rejections Under §112, Second Paragraph

Claims 3, 6 and 8 have been rejected under §112, second paragraph as being indefinite for reciting a narrow range or limitation that falls within the broad range or limitation in the same claim. By this amendment, claims 3, 6 and 8 have been cancelled. Hence, the rejection under §112 has been rendered moot.

Rejections Under §102(b)

Claims 7 and 13 have been rejected under §102(b) as being anticipated by WO 97/04167 to Wikstrom. Claims 7 and 13 have been cancelled. New claims 21 and 30 correspond to cancelled claims 7 and 13, respectively.

The Examiner contends that Wikstrom discloses an oxidized APS that has been treated with sodium hydroxide and sodium hypochlorite, and thus, anticipates the oxidized starch of claim 7. Applicants respectfully disagree.

New claim 21 recites an oxidized starch that is obtained by a specific process. The specific process has two steps: (1) treating the APS with an alkali metal hypochlorite at a pH between 6.5 to 8.5 to form an oxidized starch product; and (2) subjecting the oxidized starch product to an alkaline treatment comprising keeping the starch product at a temperature of 20-50°C and a pH of higher than 10, for at least 15 minutes.

The Examiner points to Example 2 on page 4 of Wikstrom which discloses oxidization of APS using sodium hydroxide at a constant pH of 9.5. Wikstrom does not disclose the above two steps, namely, first treating at a pH of between 6.5 to 8.5 than treating at a pH of higher than 10, at the above temperatures. Thus, Wikstrom cannot be found to anticipate new claim 21.

In the office action, the Examiner states that Wikstrom discloses the APS starch being used to produce finishing agent, and therefore, anticipates the coating of claim 13. Applicants respectfully disagree.

New claim 30 recites a coating of glass fibers in warp yarn sizing that consists essentially of a starch product obtained by the process of (1) treating the APS with an alkali metal hypochlorite at a pH between 6.5 to 8.5 to form an oxidized starch product; and (2) subjecting the oxidized starch product to an alkaline treatment comprising keeping the starch product at a temperature of 20-50°C and a pH of higher than 10, for at least 15 minutes.

As discussed above, Wikstrom does not disclose the two step process of the claimed invention. Therefore, Wikstrom can not be found to anticipate new claim 30.

Accordingly, Applicants respectfully request that the rejections under §102 (b) based on Wikstrom be reconsidered and withdrawn.

Claims 7, 11, and 14 have been rejected under §102(b) as being anticipated by EP 799837 to Huizenga. The Examiner contends that Huizenga discloses APS in different products including food products and adhesives “which anticipates the adhesive of instant claim 11 and the food additive of instant claim 14.” Applicants respectfully disagree.

Claims 7, 11 and 14 have been cancelled. New claims 21, 28 and 31 correspond to cancelled claims 7, 11 and 14, respectively. As discussed above, new claim 21 recites an

oxidized starch that is obtained by a specific process ((1) treating the APS with an alkali metal hypochlorite at a pH between 6.5 to 8.5 to form an oxidized starch product; and (2) subjecting the oxidized starch product to an alkaline treatment comprising keeping the starch product at a temperature of 20-50°C and a pH of higher than 10, for at least 15 minutes). Huizenga does not disclose such a process, therefore, Huizenga does not anticipate claim 21.

Claim 28 recites an adhesive consisting essentially of a starch product obtained by a specific process, namely, the process recited in claim 21, discussed above. Claim 31 recites a food additive consisting essentially of the starch product of claim 21, also. Huizenga does not disclose the specific process or resulting starch product of the claims, therefore, can not be found to anticipated claims 28 or 31.

Accordingly, Applicants respectfully request that the rejections under §102(b) based on Huizenga be reconsidered and withdrawn.

Claims 7, 10 and 12 have been rejected under §102(b) as being anticipated by U.S. Patent No. 4,171,407 to Elser et al. According to the Examiner, Elser et al. disclose the use of amylopectin as protective colloids that are used to prepare coatings on paper, which allegedly anticipates claims 7, 10 and 13. Applicants respectfully disagree.

Claims 7, 10 and 12 have been cancelled. New claims 21, 27 and 29 correspond to cancelled claims 7, 10 and 12 respectively. As discussed above, new claim 21 recites an oxidized starch that is obtained by a specific process. Elser et al. do not disclose such a

process, therefore, Elser et al. do not anticipate claim 21. Furthermore, Elser et al. do not disclose the use of an APS, which is required by the claimed invention.

Claim 27 recites a binder in paper coating and claim 29 recites a protective colloid. Both consist essentially of a starch obtained by the process of claim 21. As discussed above, Elser et al. do not disclose either the two-step process required by the claims or the use of a required APS.

For the foregoing reasons, Elser et al. cannot be found to anticipate claims 21, 27 and 29. Accordingly, Applicants respectfully request that the rejections under §102(b) based on Elser et al. be reconsidered and withdrawn.

Rejections Under §103(a)

Claims 1-8 have been rejected under §103(a) as being unpatentable over Wikstrom in view of GB 1,425,822 to Whitaker or U.S. Pat. No. 4,841,040 to Just. The Examiner admits that “the claimed invention differs from the Wikstrom WO patent by disclosing that the alkaline treatment is performed at a pH higher than 10.5 for at least 15 minutes at a temperature of 20-50° C and that the starch is treated with the alkali metal hypochlorite at a pH between 6 and 10.”

In addition to the differences admitted by the Examiner, Applicants point out that the claimed process requires the use of an APS, and has two required steps (1) treating the APS with an alkali metal hypochlorite at a pH between 6.5 to 8.5 to form an oxidized starch

product; and (2) subjecting the oxidized starch product to an alkaline treatment comprising keeping the starch product at a temperature of 20-50°C and a pH of higher than 10, for at least 15 minutes.

Whitaker discloses cementitious compositions that contain an oxidized polysaccharide. Whitaker does not contemplate the use of an APS. There is absolutely no suggestion in Whitaker to first treat a starch with an alkali metal hypochlorite at a pH between 6.5 to 8.5 to form an oxidized starch product, then to subject the oxidized starch product to an alkaline treatment comprising keeping the starch product at a temperature of 20-50°C and a pH of higher than 10, for at least 15 minutes.

Just discloses a phosphated, oxidized starch useful as a dispersant. In fact, Just requires the starch to be phosphated. Just does not disclose the use of APS, or the two step process of the claimed invention discussed above.

In order to establish a *prima facie* case of obviousness, one of the criteria to be met is that the prior art references, when combined, must teach or suggest all of the claim limitations. See MPEP §2142.

Applicants' have demonstrated the importance of utilizing an APS, and the importance of both steps of the claimed process.

Upon combining the teachings Wikstrom with Whitaker or Just, all of Applicants' claimed limitations are not taught or suggested. Therefore, based on the foregoing

discussion, Applicants' claimed invention is not obvious over Wikstrom in view of Whitaker or Just.

In light of the foregoing amendments and remarks, Applicants respectfully submit that the application is now in condition for allowance. If the Examiner believes a telephone discussion with the Applicant's representative would be of assistance, she is invited to contact the undersigned at her convenience.

Respectfully submitted,



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